

CLAIMS

1. A method of regulating quorum sensing comprising modulating the ability of LuxR or a homologue of LuxR to activate transcription.
2. A method according to claim 1 wherein said homologue of LuxR is selected from the list consisting of AhlR, AhyR, AsaR, BafR, BisR, BpsR, BviR, CarR, CepR, CerR, CinR, CsaR, CviR, EagR, EcbR, EchR, EsaR, ExpR, HalR, LasR, LuxS, Mll8752, MupR, PcoR, PhzR, PmlR, PpuR, PsmR, PsyR, RaiR, RhiR, RhlR, SdiA, SdiR, SmaR, SolR, SpnR, SprR, SwrR, TraR, TriR, TrlR, TrnR, VanR, VsmR, Y4qH, YenR, YpeR, YpsR, YruR, YtbR and YukR.
3. A method according to claim 1 or claim 2 wherein quorum sensing is downregulated by treating bacteria with a peptide hydrolase.
4. A method according to claim 3 wherein said peptide hydrolase is selected from the group consisting of Arg-C proteinase, Asp-N endopeptidase, BNPS Skatole, CNBr, chymotrypsin, clostripain, formic acid, glutamyl endopeptidase, iodosobenzoic acid, lysC, NTCB (2-nitro-5-thiocyanobenzoic acid), pepsin, proline-endopeptidase, proteinase K, Staphylococcal peptidase I, thermolysin and trypsin.
5. A method according to any preceding claim wherein a biofilm is inhibited.
6. A method according to claim 5 wherein said biofilm is caused by *Pseudomonas*, *Burkholderia*, *Klebsiella*, *Acinetobacter*, *Flavobacterium*, *Enterobacter* or *Aerobacter*.
7. A method according to claim 5 or claim 6 wherein said surface is wood, glass, concrete, plastic, ceramic, porcelain or metal.
8. A method according to any one of claims 5 to 7 wherein said surface forms part of a denture, a contact lens, an artificial valve, a prosthetic implant, a catheter, a pacemaker or a surgical pin.
9. Use of a composition comprising a peptide hydrolase and an aqueous or a non-aqueous carrier for disrupting the quorum sensing signal pathway of bacteria.
10. A use according to claim 9, wherein the composition further comprises one or more compounds selected from the group consisting of a detergent, a surfactant, a biocide, a fungicide, an antibiotic or a mixture thereof.

11. A use according to claim 9 or claim 10 wherein the composition further comprises one or more of a pH regulator, a perfume, a dye or a colorant.
12. A use according to any one of claims 9 to 11, wherein said composition is in the form of a spray, a foam, a slurry, a dispensable liquid or is freeze dried.
- 5 13. A method according to claim 1 or claim 2 wherein quorum sensing is upregulated by treating bacteria with peptide hydrolase inhibitor.
14. A method according to claim 13 wherein said peptide hydrolase inhibitor is selected from the group consisting of serine protease inhibitors, including PMSF and Benzamide; cysteine (thiol) protease inhibitors, including PHMB and leupeptin; aspartate (acidic) protease inhibitors, including pepstatin and DAN; and metalloprotease inhibitors, including EDTA and EGTA.
- 10 15. A method according to claim 12 or claim 13 wherein said bacteria is *Bacillus subtilis*, *Streptococcus pneumoniae*, *Staphylococcus aureas*, *Vibrio salmonicida*, *Aeromonas hydrophila*, *Burkhoderia ambifaria*, *Burkholderia pseudomallei*, *Burkholderia mallei*, *Burkholderia stabilis*, *Burkholderia vietnamiensis*, *Burkholderia multivorans*, *Escherichia coli*, *Serratia marcescens*, *Salmonella typhi*, *Brucella suis*, *Brucella melitensis*, *Yersinia ruckeri*, *Hafnia alvei*, *Shigella flexneri*, *Serratia liquefaciens*, *Enterococcus faecalis*, *Pseudomonas aeruginosa*, *Burkholderia cepacia*, *Pseudomonas fluorescens*, *Providencia stuartii*, *Klebsiella aerogenes*, *Yersinia pestis*, *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*.
- 15 20 16. A method according to any one of claims 12 to 15 wherein an exogenous gene is inserted into the operon controlled by quorum sensing.
17. A method according to claim 16 wherein said exogenous gene is required to be transported to the bacterial cell surface.
- 25 18. A method according to claim 16 wherein said exogenous gene encodes an antigen.
19. A method according to claim 18 wherein said antigen is of bacterial or viral origin.
20. Use of a composition comprising a peptide hydrolase inhibitor and an aqueous or a non-aqueous carrier for upregulating the quorum sensing signal pathway of bacteria.